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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,678	12/13/2000	Selim Shlomo Rakib	TER-002.3P D3	2713

26717 7590 05/05/2005

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EXAMINER	
SCHEIBEL, ROBERT C	
ART UNIT	PAPER NUMBER
2666	

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/737,678	RAKIB ET AL.	
	Examiner	Art Unit	
	Robert C. Scheibel	2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *84-143* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *84-143* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/23/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Applicant has not provided copies of references of previously submitted references on form 1449 in this application (as allowed under 37 CFR 1.98(d)). However, examiner has been unable to locate the document titled "Westlaw Dialog Search". While not required, examiner respectfully requests applicant to submit a copy of this document in order to expedite prosecution of this application.

Priority

2. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence(s) of the specification or in an application data sheet by identifying the prior application by application number (37 CFR 1.78(a)(2) and (a)(5)). If the prior application is a non-provisional application, the specific reference must also include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

The Declaration filed 12/13/2000 lists application number 09/616,071 as an application to which priority under 35 U.S.C. 120 is claimed. However, this application is not mentioned in the first paragraph of the application as required (see previous paragraph).

Claim Objections

3. Claim **1** is objected to because of the following informalities: "upstream payload digital data" in lines 14-15 should be changed to "upstream digital payload data" to match the language used in lines 11-12. Appropriate correction is required.

4. Claim **95** is objected to because of the following informalities: the phrase "and wherein said" is repeated in lines 5 and 6. Appropriate correction is required.

5. Claim **109** is objected to because of the following informalities: the phrase "includes comprises" in line 1 does not make sense. Appropriate correction is required.

6. Claim **112** is objected to because of the following informalities: "upstream payload digital data" in line 13 should be changed to "upstream digital payload data" to match the language used in line 9. Claims **113-117** contain the same phrase which should be corrected accordingly. Appropriate correction is required.

7. Claims **119 and 120** are objected to because of the following informalities: "upstream payload data" should be changed to "upstream digital payload data" for consistency. Applicant is requested to search for similar inconsistencies and correct them in the response.

8. Claims **130 and 131** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. Claim 130 depends on itself and thus does not comply with 37 CFR 1.75(c). Claim 131 depends from claim 130 and is thus of improper dependent form as stated above. For purposes of examination, examiner has made the assumption that claim 130 depends from claim 126. (Note that claim 130 contains the limitation "said information vectors" and that this limitation is not introduced in claim 124.)

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims **84-138 and 140** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim **84** recites the limitation "said headend modem" in line 5 as well as later in the claim. There is insufficient antecedent basis for this limitation in the claim. The limitation "a headend modem appears in both lines 1 and 4 and it is not clear to which of these the limitation of line 5 is referring. This rejection can be overcome by changing "a headend modem" in line 4 to "said headend modem".

Claim **112** recites the limitation "said headend modem" in line 5 as well as later in the claim. There is insufficient antecedent basis for this limitation in the claim. The limitation "a headend modem appears in both lines 1 and 3 and it is not clear to which of these the limitation of line 5 is referring. This rejection can be overcome by changing "a headend modem" in line 3 to "said headend modem".

Claim **124** recites the limitation "said headend modem" in line 12 as well as later in the claim. There is insufficient antecedent basis for this limitation in the claim. The limitation "a headend modem appears in both lines 1 and 4 and it is not clear to which of these the limitation of line 5 is referring. This rejection can be overcome by changing "a headend modem" in line 4 to "said headend modem".

Claim **132** recites the limitation "said headend modem" in line 18 as well as later in the claim. There is insufficient antecedent basis for this limitation in the claim. The limitation "a headend modem appears in both lines 2 and 4 and it is not clear to which of these the limitation of line 5 is referring. This rejection can be overcome by changing "a headend modem" in line 4 to "said headend modem".

Claim **84** recites the limitation "any modulation scheme" in line 4, the limitation "any modulation method" in line 15, and the limitation "any multiplexing method" in lines 16-17. These limitations are ambiguous.

Claim **97** recites the limitation "any other signal with good autocorrelation properties" and claim **101** recites the limitation "any signal which has good autocorrelation properties". These limitations are not definite as it is unclear what is meant by "good autocorrelation properties".

Claim **112** recites the limitation "any modulation scheme" in line 4, the limitation "any modulation method" in line 13, and the limitation "any multiplexing method" in lines 15-16. These limitations are ambiguous.

Claim **123** recites the limitation "any modulation method" in line 2. This limitation is ambiguous.

Claim **124** recites the limitation "any modulation scheme" in line 4 and the limitation "any modulation method" in line 23. These limitations are ambiguous.

Claim **132** recites the limitation "any modulation scheme" in line 5 and the limitation "any modulation method" in line 29. These limitations are ambiguous.

Claim **137** recites the limitation "any modulation method" in line 6. This limitation is ambiguous.

Claim **140** recites the limitations "any form of multiplexing" and "any form of modulation" in lines 12-13. These limitations are ambiguous.

Claim **141** recites the limitation "any code division multiplexed or time division multiplexed transmitter" in line 4. This limitation is ambiguous.

Claim **87** recites the limitation "said transmit frame timing delay" in line 3. There is insufficient antecedent basis for this limitation in the claim. The phrase "upstream frame timing delay" is included in claim 85 and may be the limitation to which this claim intends to refer.

Claim **95** recites the limitation "said upstream payload data" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim. This could be referring to "upstream payload data" found earlier in line 5 of this claim, or the same phrase in claim 84. This rejection can be overcome by changing the first "upstream payload data" in line 5 to "said upstream payload data".

Claim **100** recites the limitation "said recovered master carrier" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

The phrase "boundless ranging" in line 10 of claim **102** is ambiguous. Applicant is requested to amend the claim to clarify this limitation.

Claim **103** recites the limitation "said multiple streams of said digital upstream payload data" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim **103** recites the limitation "said data" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether this limitation refers to upstream data, downstream data, etc.

Claim **103** recites the limitation "said input streams of digital upstream payload data" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim **104** recites the limitation "said multiple streams of said digital upstream payload data" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim **104** recites the limitation "said data" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether this limitation refers to upstream data, downstream data, etc.

Claim **104** recites the limitation "said input streams of digital upstream payload data" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim **104** recites the limitation "said real information vectors" in line 19. There is insufficient antecedent basis for this limitation in the claim.

Claim **104** recites the limitation "said imaginary information vectors" in lines 23-24. There is insufficient antecedent basis for this limitation in the claim.

Claim **105** recites the limitation "said code division multiple access multiplexer" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim **109** recites the limitation "each element of each information vector" in line 2. There is insufficient antecedent basis for this limitation in the claim (information vector has not been described previously in the claim).

Claim **111** recites the limitation "said upstream data" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim **111** recites the limitation "said downstream messages" in line 7. There is insufficient antecedent basis for this limitation in the claim. It appears that this limitation refers to "downstream code allocation messages" from line 3 of claim 111. This rejection can be overcome by changing the above limitation to "said downstream code allocation messages".

Claim **112** recites the limitation "said downstream data" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by replacing the above phrase with "said downstream digital data".

Claim **112** recites the limitation "said downstream payload data" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claims **114-123** recite the limitation "the process" in line 1. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by replacing this phrase with "the method" in these claims.

Claims **115 and 117** recite the limitation "said upstream carrier" in line 2. There is insufficient antecedent basis for this limitation in the claim. This phrase should be changed to "said local upstream carrier" to avoid confusion with other upstream carriers recited in the claims.

Claim **120** recites the limitation "said transmitter" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim **121** recites the limitation "said transmit frame timing delay" in lines 3-4, and "the transmit frame timing delay" in line 6 and lines 7-8. There is insufficient antecedent basis for

this limitation in the claim. This rejection can be overcome by changing "transmit" to "upstream" in the above limitations.

Claim **124** recites the limitation "said downstream payload data" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim **124** recites the limitation "said downstream data" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim **124** recites the limitation "said transmit frame timing delay value" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim.

Claim **126** recites the limitation "said upstream payload data" in lines 2 and 4. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by changing this limitation to "said upstream *digital* payload data" in both instances.

Claim **127** recites the limitation "said upstream payload data" in lines 2 and 4. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by changing this limitation to "said upstream *digital* payload data" in both instances.

Claim **133** recites the limitation "from time to time" in line 2. This limitation is ambiguous.

Claim **133** recites the limitation "said upstream transmitter" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Claim **134** recites the limitation "said upstream payload data" in lines 1-2 and 4. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by changing this limitation to "said upstream *digital* payload data" in both instances.

Claim **140** recites the limitation "said central unit transceiver" in lines 2 and 3. There is insufficient antecedent basis for this limitation in the claim.

Double Patenting

11. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

12. Applicant is advised that should claim **105** be found allowable, claim **106** will be objected to under 37 CFR 1.75 as being a duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

13. Applicant is advised that should claim **126** be found allowable, claim **127** will be objected to under 37 CFR 1.75 as being a duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims **84, 112, and 139-140** are rejected under 35 U.S.C. 102(b) as being rejected by U.S. Patent 3,967,058 to Moriya, et al.

Regarding claims **84 and 112**, Moriya discloses a remote unit modem (Slave Terminal R of Figure 1) to transmit digital data upstream to a headend modem (Master Terminal S of Figure 1). Moriya discloses the limitation of a digital data receiver for receiving downstream digital data in the transmitting and receiving circuit 6 of the Slave Terminal R of Figure 1. This data is transmitted from a headend modem (Master Terminal S of Figure 1). The limitation of the master clock being encoded in either the downstream payload data or other data is discloses in the clock circuit 2 of Figure 1 and as described in lines 15-23 of column 2. It is clear that the clock signal is encoded in this data as the slave terminal is able to extract the clock signal with the clock extraction circuit 9. The limitation that the digital data receiver recovers the payload data and the master clock is disclosed in lines 35-40 of column 2. The further limitation that an upstream clock is generated from the recovered master clock is disclosed in lines 41-44 of column 2. Moriya also discloses a digital data transmitter (transmitting and receiving circuit 6) for coupling to a source of upstream digital payload data from one or more sources (signal generator 11 of Figure 1). Moriya further discloses the limitation of using the upstream clock to transmit known preamble data and upstream payload data in lines 41-44 of column 2.

Similarly, regarding claims **139 and 140**, Moriya discloses remote unit modems (Slave Terminal R of Figure 1) coupled to central unit modems (Master Terminal S of Figure 1). The remote unit modem recovers the master clock and downstream data (lines 35-40 of column 2) and then uses a local clock generated from the recovered master clock to transmit upstream preamble and payload data (lines 41-44 of column 2).

16. Claims **124-125** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,548,583 to Bustamante, et al.

Regarding claim **124**, Bustamante discloses a digital data receiver (modulator and RF circuits of the handset – see figures 3B and 3C, for example) for receiving downstream digital data transmitted in frames (see figure 6) from a headend modem (base station – Figures 1A or 1B, for example). Clearly, the receiver is functioning to recover downstream payload data and must be aware of the frame marker signal. Bustamante further discloses a digital data transmitter (modulator and RF circuits of the handset – see figures 3B and 3C, for example) for coupling to a source of upstream digital payload data (see "voice or data" input in figures 3B and 3C) having a first clock rate from one or more sources and organizing upstream digital payload data into upstream frames (see figure 6) of the same length as said downstream frames (see lines 15-16 of column 11), and having ranging means for transmitting a ranging signal (see lines 24-30 of column 3). Bustamante further discloses the limitation of the upstream transmitter generating a chip clock at a much higher rate than said first clock rate (PN coder in figures 3B and 3C) and for generating an upstream carrier and for using said chip clock to multiply one or more orthogonal spreading codes times the upstream data in one or more upstream frames to generate

one or more upstream frames of spread spectrum data (again, see figures 3B and 3C for example).

Regarding claim **125**, Bustamante discloses the limitation that the transmitters adjust their power such that transmissions arrive at the headend modem at approximately the same power level from line 60 of column 6 through line 2 of column 7. The limitation of using quadrature amplitude modulation is not explicitly disclosed in Bustamante, modified. However, it is well known in the art. It is simply an equivalent way of modulating the signal and would have been obvious to one of ordinary skill in the art to modify Bustamante to use quadrature amplitude modulation as a substitute for QPSK. Further, it is inherent that Bustamante must ensure that frame synchronization is maintained, as without it, communication is not possible.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

19. Claims **84-89, 95, 96, 98-100, 110, 112-114, 118, 121, 132-133, and 141-143** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,548,583 to Bustamante, et al in view of U.S. Patent 3,967,058 to Moriya, et al.

Regarding claims **84, 85, 95, 96, 98, 99, 110, 112, 114, 118, 121, 132, 141, and 142**, Bustamante discloses the limitation of receiving downstream digital data transmitted in frames from a headend modem (see figure 6; also, the base station is the headend modem and the handset is the remote unit modem). Bustamante inherently discloses the step of presenting the downstream data as this data would have no use otherwise. The step of receiving upstream digital payload data is disclosed by Bustamante in the voice or data inputs in Figures 3B and 3C. The step of organizing upstream digital payload data into upstream frames the same length as downstream frames is disclosed in figure 6. The step of transmitting a ranging signal is disclosed in lines 24-30 of column 3. The step of receiving messages back from the headend modem to adjust frame timing delay values for frame synchronization is disclosed in figure 6 as well; frame synchronization is necessary in order for the duplex transmission of the frames to work properly. The step of using a chip clock to multiply spreading codes by the upstream data is disclosed in the PN coder of figures 3B and 3C. The transmitting the upstream frames of spread spectrum payload data is disclosed in the modulator and RF circuits of figures 3B and 3C. Bustamante also discloses the ranging process limitations; see lines 24-30 of column 3 and lines 32-36 of column 13, for example. Note that all of the above claims do not necessarily contain all of the limitations listed above; the limitations listed represent the combined limitations of all the claims. The claims have been grouped together in an effort to simplify the rejection due to the

fact that there is significant overlap among this set of claims. The same is true for other claim groups included in this rejection.

Bustamante does not disclose expressly the steps of recovering a master clock encoded in the downstream frame marker signal, or the steps of generating an upstream chip clock and upstream carrier based on this recovered clock.

Moriya discloses the concept of using a master clock (the clock circuit 2 in figure 1) at a headend unit, recovering this clock at a remote unit modem, and sending upstream data from the remote end unit using a clock signal derived from the recovered master clock (see the last sentence of the abstract as well as lines 41-44 of column 2.

Bustamante and Moriya are analogous art because they are from the same field of endeavor of duplex communications systems. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bustamante to use a master clock at the base station and transmit from the handsets using the recovered master clock. The motivation for doing so would have been to reduce the cost of the system as suggested by Moriya in lines 30-35 of column 1. Therefore, it would have been obvious to combine Moriya with Bustamante for the benefit of reducing cost to obtain the invention as specified in claims 132, 141, and 142.

Regarding claims **100 and 113**, Bustamante, modified, discloses the limitations of recovering the master clock from pilot channel data and then using the recovered master clock to transmit upstream data as it is a CDMA system. Bustamante was modified by Moriya as specified above to use the recovered master clock for transmitting upstream data.

Regarding claims **86, 87, 133 and 143**, Bustamante discloses the limitation that the transmitters adjust their power such that transmissions arrive at the headend modem at

approximately the same power level from line 60 of column 6 through line 2 of column 7. The limitation of using quadrature amplitude modulation is not explicitly disclosed in Bustamante, modified. However, it is well known in the art. It is simply an equivalent way of modulating the signal and would have been obvious to one of ordinary skill in the art to modify Bustamante to use quadrature amplitude modulation as a substitute for QPSK. Further, it is inherent that Bustamante must ensure that frame synchronization is maintained, as without it, communication is not possible. Further, the limitation of predistorting the upstream data is well known in the art and would have been necessary to make Bustamante work properly in a wireless environment and is thus inherent in Bustamante, modified.

Regarding claims **88 and 89**, Bustamante discloses the limitation that the transmitters adjust their power such that transmissions arrive at the headend modem at approximately the same power level from line 60 of column 6 through line 2 of column 7. The limitation of using QAM is not explicitly disclosed in Bustamante, modified. However, it is well known in the art. It is simply an equivalent way of modulating the signal and would have been obvious to one of ordinary skill in the art to modify Bustamante to use QAM as a substitute for QPSK.

20. Claim **94** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 3,967,058 to Moriya, et al in view of U.S. Patent 5,327,455 to De Gaudenzi et al.

Regarding claim **94,** Moriya discloses the limitations of the parent claim. Moriya does not disclose expressly the limitation of claim 94 that the transmitter receives data from multiple sources and multiplexes the data from the source using a different spreading code. However, this is well known in the art. For example, De Gaudenzi discloses this limitation throughout. See the abstract for example.

Moriya and De Gaudenzi are analogous art because they are from the same field of endeavor of data communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Moriya to multiplex data from multiple sources using separate spreading codes as suggested by De Gaudenzi. The motivation for doing so would have been to allow for efficient use of the available power and bandwidth as suggested by De Gaudenzi in lines 58-60 of column 2. Therefore, it would have been obvious to combine De Gaudenzi with Moriya for the benefit of improved efficiency to obtain the invention as specified in claim 95.

21. Claims **115-117, 119-120, and 122-123** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,548,583 to Bustamante, et al in view of U.S. Patent 3,967,058 to Moriya, et al in further view of U.S. Patent 5,327,455 to De Gaudenzi et al.

Regarding claims **115-117,** Bustamante and Moriya disclose the limitations of the parent claims as discussed above. Bustamante, modified, does not disclose expressly the limitation of claims 115-117 that the transmitter receives data from multiple sources and multiplexes the data from the source using a different spreading code. However, this is well known in the art. For example, De Gaudenzi discloses this limitation throughout. See the abstract for example.

Bustamante, modified, and De Gaudenzi are analogous art because they are from the same field of endeavor of data communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bustamante, modified, to multiplex data from multiple sources using separate spreading codes as suggested by De Gaudenzi. The motivation for doing so would have been to allow for efficient use of the available power and bandwidth as suggested by De Gaudenzi in lines 58-60 of column 2. Therefore, it would have

been obvious to combine De Gaudenzi with Bustamante, modified, for the benefit of improved efficiency to obtain the invention as specified in claims 115-117.

Regarding claim **119**, Bustamante discloses the limitations of carrying out a ranging process in lines 24-30 of column 3. The step of receiving messages back from the headend modem to adjust frame timing delay values for frame synchronization is disclosed in figure 6 as well; frame synchronization is necessary in order for the duplex transmission of the frames to work properly.

Regarding claim **120**, De Gaudenzi discloses the limitation of multiplexing data from different sources using orthogonal spreading codes throughout (see the abstract for example). Further, the limitation of performing equalization is well known in the art and would have been necessary to make Bustamante work properly in a wireless environment and is thus inherent in Bustamante, modified.

Regarding claims **122 and 123**, Bustamante discloses the limitation that the transmitters adjust their power such that transmissions arrive at the headend modem at approximately the same power level from line 60 of column 6 through line 2 of column 7. The limitation of using quadrature amplitude modulation is not explicitly disclosed in Bustamante, modified. However, it is well known in the art. It is simply an equivalent way of modulating the signal and would have been obvious to one of ordinary skill in the art to modify Bustamante to use quadrature amplitude modulation as a substitute for QPSK.

22. Claims **90-93** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,548,583 to Bustamante, et al in view of U.S. Patent 3,967,058 to Moriya, et al in further view of U.S. Patent 5,673,293 to Scarpa et al.

As discussed above, Bustamante and Moriya disclose the limitations of parent claim 84. Bustamante, modified, does not disclose the limitations of claims 90-93. Scarpa discloses the limitations of claims 90-93 as discussed below. The limitation of the Hilbert transfer function of claim 90 is disclosed in the phase splitter 224 of Figure 2 (see also lines 51-53 of column 8). The limitation of claim 91 of shaping filters limiting the bandwidth to 6 MHz centered around a center frequency is disclosed in the Nyquist filter 222 of Figure 2. The value of 6 MHz is dependent on the system design. The limitations of claim 92 and 93 of an upstream filter to satisfy the Nyquist criteria is also disclosed in the Nyquist filter 222 of Figure 2.

Bustamante, modified, and Scarpa are analogous art because they are from same field of endeavor of digital communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bustamante, modified, to use the phase splitter and Nyquist filter of Scarpa. The motivation for doing so would have been to eliminate foldover distortion (see lines 60-64 of column 8) and reduce intersymbol interference. Therefore, it would have been obvious to combine Scarpa with Bustamante, modified, for the benefit of eliminating foldover distortion and reducing intersymbol interference to obtain the invention as specified in claims 90-93.

23. Claims **97 and 101** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,548,583 to Bustamante, et al in view of U.S. Patent 3,967,058 to Moriya, et al in further view of U.S. Patent 5,511,099 to Ko et al.

As discussed above, Bustamante and Moriya disclose the limitations of parent claim 84. As discussed in relation to similar claims, Bustamante and Moriya also disclose the limitations of claim 101 of recovering the master clock from the downstream data and using it to generate

upstream data. Bustamante, modified, does not disclose the limitations of claims 97 and 101 of using a Barker code. However, this is well known in the art. For example, Ko discloses the use of a Barker code as a sync signal in lines 25-34 of column 5. At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Bustamante, modified, to use Barker codes for synchronization. The motivation for doing to would have been to use a code with high autocorrelation properties as suggested by Ko in lines 28-30 of column 5. Therefore, it would have been obvious to modify Bustamante, modified, for the benefit of using a code with high autocorrelation properties to obtain the invention as specified in claims 97 and 101.

24. Claims **103, 107-109, 126-131, and 134-136** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,548,583 to Bustamante, et al in view of U.S. Patent 3,967,058 to Moriya, et al in further view of U.S. Patent 5,511,096 to Huang et al.

Bustamante and Moriya disclose all the limitations of the parent claims. However, Bustamante, modified, does not disclose expressly the limitations of claims 107-109, 126-131, 134, or 136. Huang discloses the limitations of interleaving the data, trellis coding and error correction contained in these claims throughout (see lines 35-53 of column 3 for example). Huang also discloses the limitation of a normal mode and a fallback mode in the 4/5 rate and 3/4 rate encoders/decoders. Bustamante, modified, and Huang are analogous art because they are from the same field of endeavor of digital communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bustamante to add trellis coding, error correction, and interleaving. The motivation for doing so would have been to provide a more robust method of communication. Therefore, it would have been obvious to

combine Bustamante, modified, with Huang for the benefit of improved robustness to obtain the invention as specified in claims 107-109, 126-131, and 134-136.

Allowable Subject Matter

25. Claims **102, 104-106, 111, and 137-138** would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 571-272-3169. The examiner can normally be reached on Monday and Thursday from 6:30-5:00 Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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RCS 4-21-05
Robert C. Scheibel
Examiner
Art Unit 2666

SUPERVISORY PATENT EXAMINER